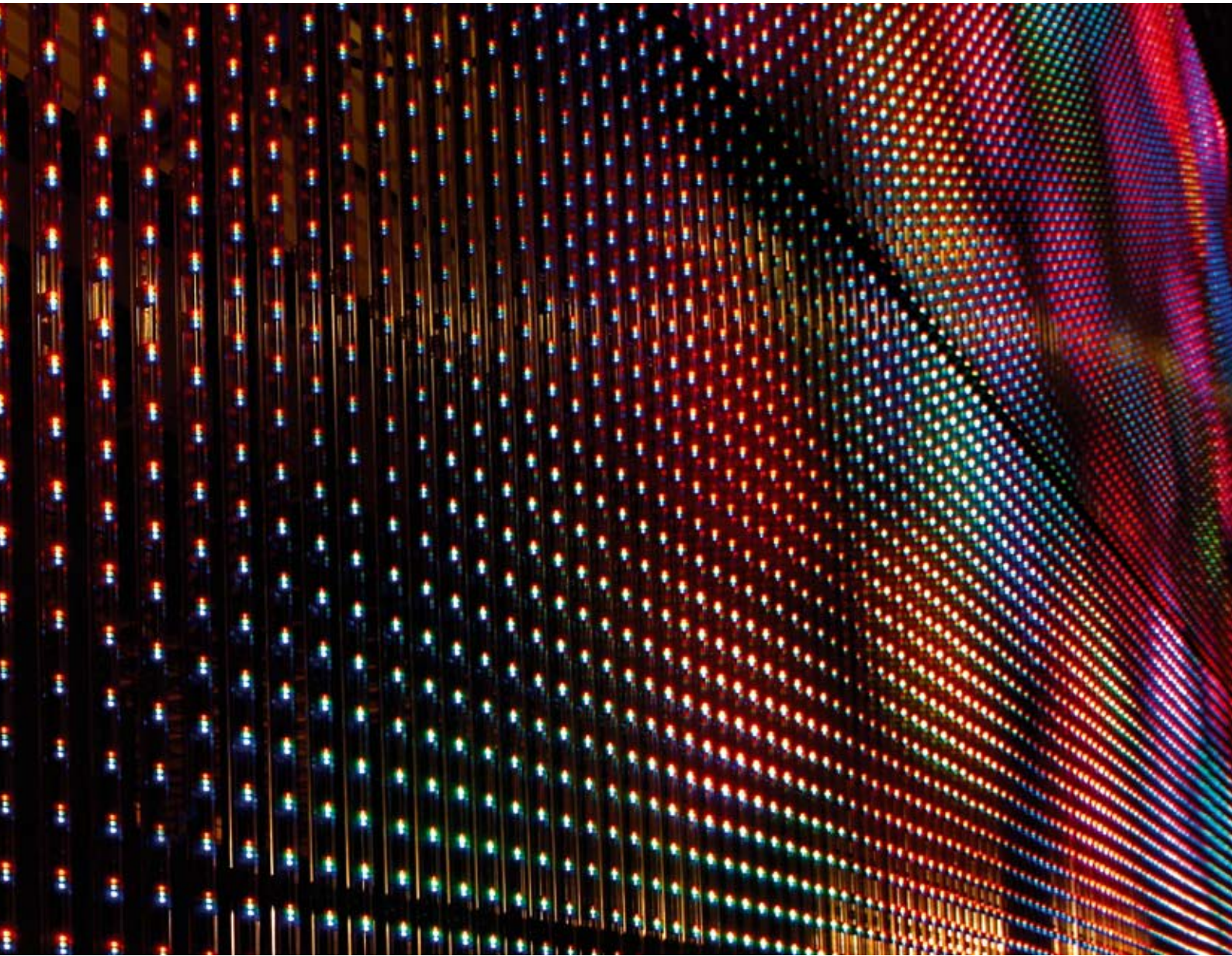


**LC Plus Series™**



**Martin®**



# New Generation Video Panels

**The LC Plus Series™ from Martin Professional is a modular system of LED video panels with new generation technology that closely integrates light, video and set design for all new possibilities in indoor and outdoor staging.**

Designed for the demanding rental and staging market, yet equally suitable for fixed installations such as retail environments and outdoor architecture, the LC Plus is an easy-to-use, all-in-one video solution.

**The LC Plus offers several key advantages over other types of LED panels:**

- Innovative P3 technology platform provides no-hassle video signal processing and distribution
  - Simplicity - intuitive setup and use
  - Creativity - increased integration with lighting and scenery
  - Reliability - tough and resilient
- Low weight and high degree of transparency expands the field of applications
- Superior color and brightness uniformity ensures outstanding image quality
- True IP65 protection for outdoor use



The P3 technology platform removes the limitations of video-type protocols for increased creative freedom, easy wiring and fast set-up. With no external power supplies, each LC Plus unit comes with everything built in - substantially reducing logistical costs and set-up time. Easy to assemble, up to 50 panels can be daisy chained for virtually unlimited design possibilities.



For set-up ease, the LC Plus uses a familiar display and button system. In addition, a 3-color LED provides instant panel status, even from a long distance.

## Semi-transparent

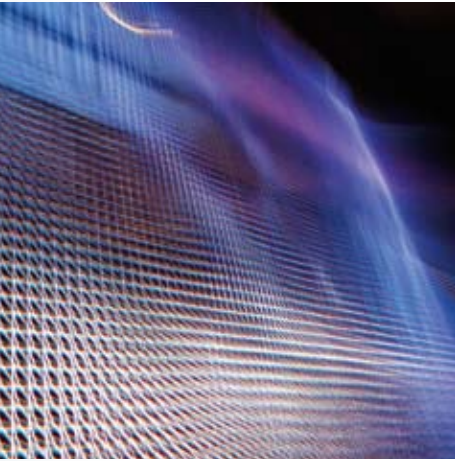
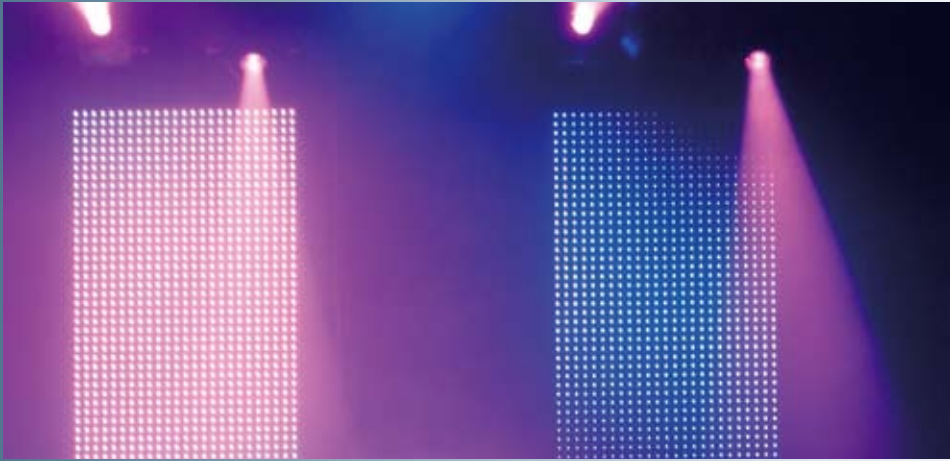
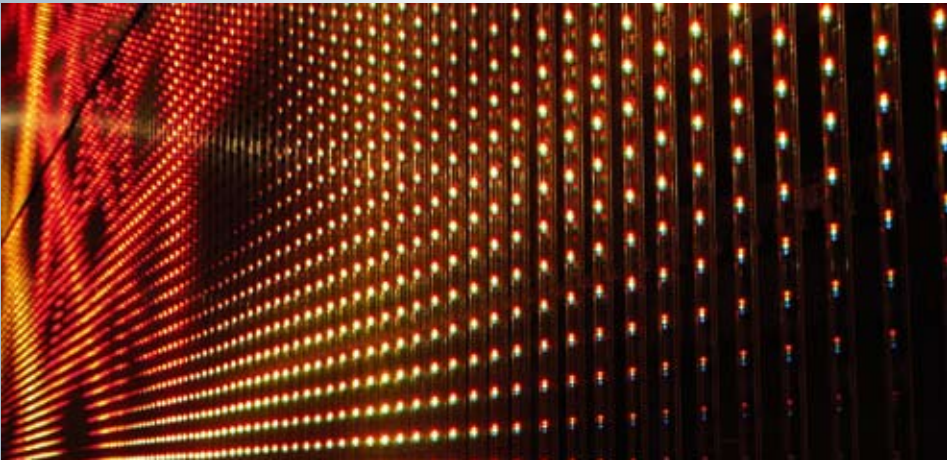
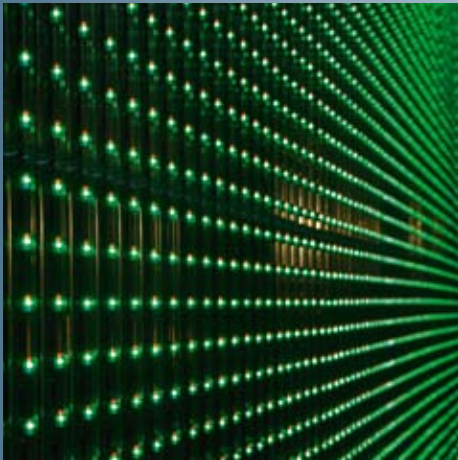
The LC Plus panels are 60% transparent and allow light and effects to pass through (audio, smoke and air too), creating increased possibilities for multi-layered looks. Dim the panels and they seem to disappear, revealing objects or performers placed upstage. In architectural applications the LC Plus panels can be placed behind windows to allow sunlight into interior spaces.

## 40 mm pixel pitch

The LC Plus's 40 mm pixel pitch is small enough for clear images at a distance and vivid graphics up close, and allows for a high level of transparency and a low weight. Image quality is significantly better than typical low resolution LED screens and the LC Plus panels are considerably less costly than higher resolution screens.

## Wide viewing angle

The LC Plus features a very wide 100° horizontal viewing angle to cover not only the front but also the sides where viewers tend to miss out.





# P3 Architecture

**The LC Plus is based on Martin's new and innovative P3 technology platform (Pixel Push Protocol) for video signal processing and distribution.**

## Simple and flexible

P3 technology makes setting up an LED wall fast and easy. It's like DMX for video. Based on Gigabit Ethernet and Cat5e wiring, the P3 technology removes the inherent limitations of video-type protocols for easy connectivity and speed of set-up.

The Ethernet based system is true plug and play, eliminating the limitations of DVI, fiber optic and coax (SDI) cable connections. Fast and easy to assemble, any cable can be up to 100 m in length and up to 50 panels can be daisy chained (no splitters or buffers needed) for virtually unlimited design possibilities.

The LC Plus uses robust, industrial RJ45 connectors and the Gigabit Ethernet technology enables 500,000 pixels with 48 bit data to be updated 60 times per second. No other system on the market comes close. Signal distribution uses inexpensive, off-the-shelf Gigabit Ethernet switches. And unlike DVI systems, the signal wiring can be plugged and unplugged during use without risk of damage.

For easy set up, the LC Plus uses a display and button system familiar to any user of MAC luminaires. A convenient 3-color LED provides instant panel status, even from a long distance.

With no external power supplies, each LC Plus unit comes with everything built in - substantially reducing logistical costs and set-up time.

## Creative and capable

P3 technology opens up a wealth of creative possibilities. For the first time, panel settings such as brightness, image mapping and image rotation can be modified in real time via a lighting console, making true integration with lighting and scenery possible.

The LC Plus runs 60 frames per second (this is not streaming video) for broadcast quality, smooth, step-free images. Latency (delay) is virtually undetectable meaning the image on the LC Plus screen is in perfect sync with the live performer.

The LC Plus can be addressed in single pixel increments and addressing of any panel can be updated in real time. As a convenient time saver, built-in test patterns can be checked before use.

## Rugged and reliable

Based on proven Gigabit Ethernet technology, P3 is tough and resilient, ideal for touring shows. For fixed installations, the use of standard Cat5e wiring makes integration a breeze.

## P3-100 System Processor

P3 technology is directed via a P3-100 System Processor, an ultra robust processing unit based on embedded Linux and solid state storage. Just one processor can handle up to 500,000 pixels (that's 800 m2 of LC Plus panels!) scaled to any size.

- Includes built-in scaling and de-interlacing. The scaler adjusts images to fit the LC screen in real time while the de-interlacer enables regular video signals to be used.
- Supports multiple video protocols and resolutions including DVI and most analog formats, eliminating the need for an expensive external processor.
- Allows key parameters including brightness and image mapping to be manipulated in real-time using DMX512, expanding the creative scope of LED
- Contains a built-in graphical user interface. Just add a monitor, mouse and keyboard.
- Images can be previewed on a local display (in real time)
- Settings can be conveniently stored on a USB stick
- LC Plus panels communicate with the P3-100 Processor to report any problems

## Upgrade existing LC Series panels

Owners of existing Martin LC Series panels can upgrade their inventory with LC Plus electronics, which adds many of the LC Plus features. The upgraded panels must be used with the P3-100 System Processor.

## Main stage of system setup using the P3-100 system controller



***Video screen layout showing placement of LC panels***



***Video content shown as full-resolution from external source***



***LC panels layout super-imposed onto video content***



***Final view of video content shown only on LC panels***



# A Perfect Match – consistency in color and brightness

**To the viewer, it's the image that counts, and with the LC Plus, image quality and consistency is exceptional. With 14 bits per color the image is extraordinary, even at greatly reduced screen brightness settings.**

Each LC Plus panel is pixel-level calibrated at our state-of-the-art calibration facility to ensure perfect color consistency from panel to panel. This superior uniformity in color and brightness not only makes for an improved image quality but also means that no more “bins” or “batches” need to be considered when adding more panels to inventory.

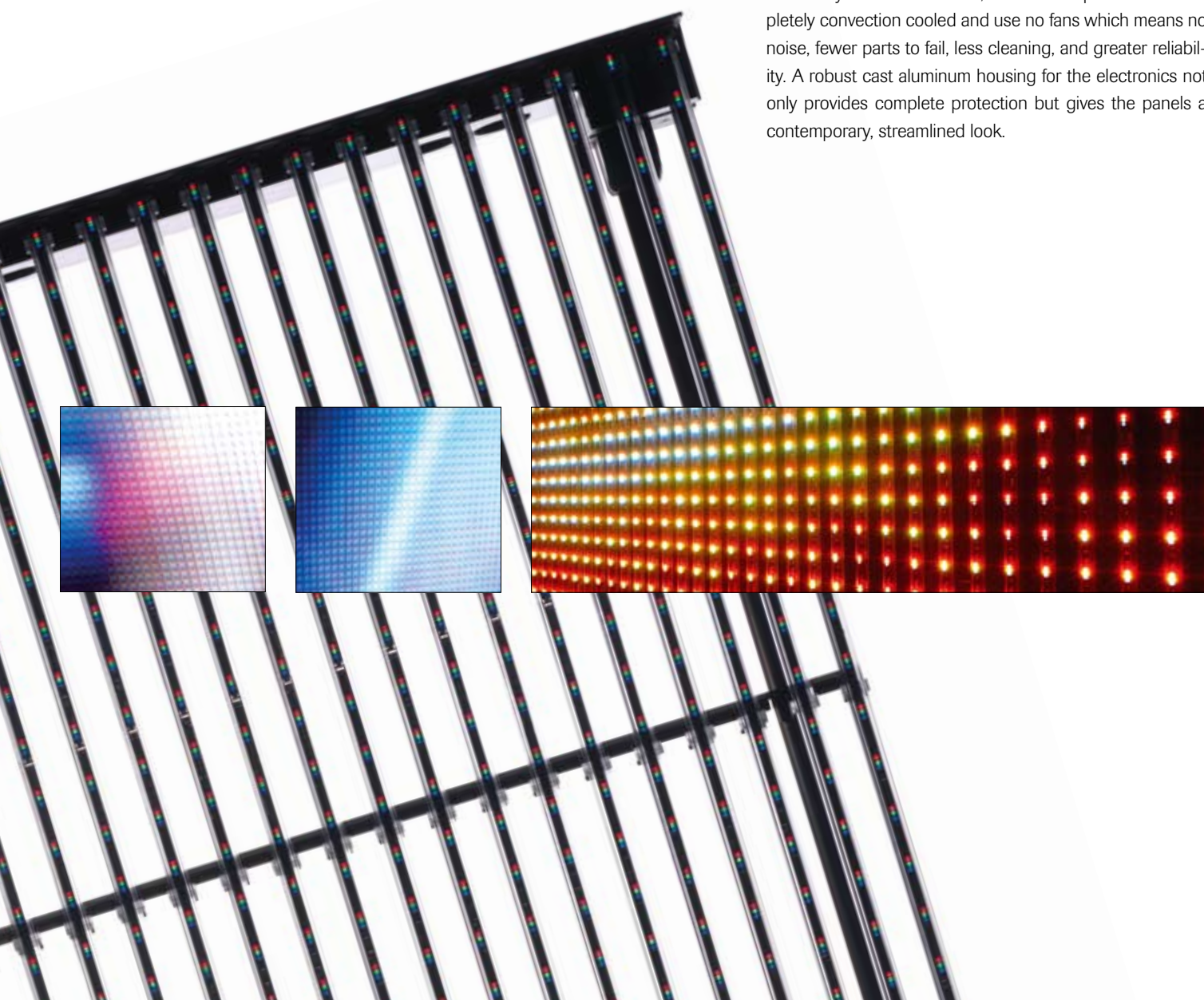
## The Great Outdoors...or Indoors

The LC Plus features a true IP65 protection rating for use in all types of environments, indoors or out. Combine that with a wide operating temperature range of -20° to +40° C and the LC Plus is suitable for most types of outdoor entertainment including permanent installations such as theme parks, cruise ships or other outdoor areas.

The LC Plus's high level of brightness - 3000 nits (cd/m²) - is more than sufficient for any indoor use and bright enough for most outdoor applications.

## Hassle-free

Essentially maintenance free, the LC Plus panels are completely convection cooled and use no fans which means no noise, fewer parts to fail, less cleaning, and greater reliability. A robust cast aluminum housing for the electronics not only provides complete protection but gives the panels a contemporary, streamlined look.





# Specifications

## Physical

Height:	LCP 2140 2000 mm (78.7 in.)
Width:	1000 mm (39.4 in.)
Depth:	172 mm (6.8 in.)
Weight:	LCP 2140 22.4 kg (49.4 lbs.)

## Control and Programming

Addressing and status:	Four-button panel, LED display and status LEDs
Setup testing:	Local test patterns

## Video Processing

Video signal processor:	External P3 processor (one per system)
Processor capacity:	500 000 pixels (400 LCP 2140 panels) with P3-100 Processor
Output resolution:	Any within 500k pixel limit
Total system latency:	Less than 3 frames
DVI video input:	Up to 1600 x 1200 (all VESA standards supported)
Analog video input:	Composite, component and S-video
Video input signal frequency:	50 - 75 Hz
Genlock:	Yes, integrated in P3 processor
Image rotation:	Yes, integrated in P3 processor
Scaling:	Yes, integrated in P3 processor
De-interlacing:	Yes, integrated in P3 processor
Gamma curve selection and adjustment:	Yes, integrated in P3 processor
Overall brightness control by DMX512:	Yes, integrated in P3 processor
Real-time panel content remapping:	Yes, integrated in P3 processor

## P3 Signal Protocol

Signal type:	Gigabit Ethernet
Protocol:	Proprietary Martin P3
Hot pluggable:	Yes, electrically isolated at all connections
Cable type:	Cat 5e
Cable length:	Up to 100 m (328.1 ft.) between any panels or controller
Max. number of panels per line:	50
Latency between first and last panel:	None

## Photometric Data

Light source:	5 mm (0.2 in.) oval LED
Brightness (calibrated):	3000 Nit (candela per square meter)
Pitch (pixel center-to-center):	40 mm (1.6 in.)
Red dominant wavelength:	621 nm
Green dominant wavelength:	527 nm
Blue dominant wavelength:	470 nm
Color resolution:	16 bits per color
Viewing angle:	>100° horizontal, >40° vertical at 50% intensity

## Construction

Panel frames:	Aluminum
LED tubes:	UV-resistant acrylic
Transparency through panel (unmasked area):	>60%
Color:	Matt black
Protection rating:	IP65, NEMA 4

## Installation

Orientation:	Individually mounted panel any angle; stack or suspended chain horizontal or vertical only
Max. suspended in one chain:	Max. six 2140 panels hung vertically per single chain
Max. stacked:	Max. seven 2140 panels standing vertically per single stack
Panel interlocking:	Polyte CCS6 conical coupler system

## Connections

Power in/out:	Ruggedized IP67-rated power connectors
P3 data in/out:	Ruggedized IP67-rated RJ45 connectors

## Electrical

AC power:	200-240 V nominal, 50/60 Hz
Power supply unit:	Integrated, auto-sensing multi-voltage
Standby power:	<35 W
Main fuse:	LCP 2140 EU models 10 AT; LCP 2140 US models 2 x 10 AT

## Thermal

Cooling:	Convection
Maximum ambient temperature (Ta max.):	40° C (104° F)
Minimum ambient temperature (Ta min.):	-20° C (-4° F)
Total heat dissipation (calculated, +/- 10%):	1160 BTU/hr.

## Approvals

EU safety:	EN 60825-1, EN 60950
EU EMC:	EN 55022, EN 55024, EN 61000-3-2, EN 61000-3-3
US safety (pending):	ANSI/UL 60950-1
Canadian safety (pending):	CAN/CSA 60950-1-03

## Included Items

Polyte CCS6 conical couplers and threaded spigots
Power and data cables

## Accessories

Conical couplers (Polyte CCS6 system)	
Four-unit flightcase for 4 x LCP 2140 video panels:	P/N 91510120
Martin™ P3-100" System Processor Installation and Safety Manual:	P/N 35000226
Martin™ P3-100" System Processor User Documentation CD:	P/N 35005008
All LC Plus and P3 system controller user documentation is also available for download free of charge from the Product Support area at <a href="http://www.martin.com">www.martin.com</a>	

## Ordering Information

LCP 2140 US model (FLC):	P/N 90354105
LCP 2140 US model (CBB):	P/N 90354106
LCP 2140 EU model (FLC):	P/N 90354101
LCP 2140 EU model (CBB):	P/N 90354102
Martin™ P3-100" System Processor:	P/N 90721010

FLC = Flightcase, CBB = Cardboard box

## Martin Professional A/S

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Founded in 1986 and headquartered in Aarhus, Denmark, Martin Professional is a world leader in the creation of dynamic lighting solutions for the entertainment, architectural, and commercial sectors. Martin lighting solutions are industry standard on top tours and events, grace prestigious theatres, energize nightclubs, and decorate major television studios around the globe. The company operates the industry's most complete and capable distributor network with local partners in nearly 100 countries. For more information please visit [www.martin.com](http://www.martin.com)



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